

The Echinoderms Newsletter<sup>1</sup>

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Here, at last, is No. 7. Yet again, we're sorry for delays, which were largely unavoidable.

At the Second Echinoderms Conference at Rovinj, it was decided that the Newsletter should continue essentially in its present form, but that volunteer regional editors might be able to send us up-to-date information on research activities in their regions, information that we might not otherwise obtain. The regional editors are listed in this issue. Also included with this issue is a revised directory, with names and addresses. There are now approximately 550 individuals on the mailing list.

We wish to thank several people who assisted in the preparation of this issue. Annette Stonework has typed the stencils for every issue of the Echinoderms Newsletter, and prepared most of the present issue. Tamara Vance, Cynthia Gust, Michael Carpenter, Linda Griffin and Katherine Stemler helped to duplicate and collate the many thousands of pages. Without the willing help of these people, this Newsletter might never have seen the light of day.

David L. Pawson  
Maureen E. Downey

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<sup>1</sup>The Echinoderms Newsletter is not intended to be part of the scientific literature, and should not be cited, abstracted, or reprinted as a published document.

## Second Echinoderms Conference

The Second Echinoderms Conference was held in Rovinj, Yugoslavia, September 26 to October 1, 1975. We are most grateful to Dr. Dusan Zavodnik and the "Rudjer Boscovic" Institute Center for Marine Research for arranging this highly successful conference. The accommodations were excellent, and two interesting field trips were arranged for the participants, one by bus to Limski Kanal, Porec, Beram and Pazin, and a boat trip on the R/V Vila Velebita to dredge for (what else?) echinoderms. Forty-six papers were read at the Conference, and the proceedings will be published in Thalassia.

## Third Echinoderms Conference

Here are the results of the voting on the venue for the next Conference.

- |                         |                |
|-------------------------|----------------|
| 1. Australia (37 votes) | 4. Israel (19) |
| 2. Jamaica (33)         | 5. Eire (15)   |
| 3. England (27)         | 6. Others (2)  |

Thus, Australia wins by a narrow margin. The next Conference will probably be held in Sydney, and will be organised by Dr. F.W.E. Rowe, The Australian Museum, College St., Sydney, N.S.W., Australia. More information will be given in the next Newsletter.

Many correspondents have suggested that the world be divided into regions (for example, Old World, New World and Western Pacific area) and that a conference be held in one of these regions every two years. Thus, for example, a New World resident should expect a conference to be held in his region once every six years. This seems like a good idea and it might work very well. The voting above, although hardly representative of our entire mailing list, would seem to indicate that the echinoderm world might logically be divided into three parts. For the sake of argument, then, we would like to suggest that the 4th conference be held in the New World (Jamaica??) around 1980. How do you feel about it?

## Regional Editors for Echinoderms Newsletter

The response to our request for volunteers to act as regional editors has been overwhelming. A total of 63 people from 27 countries or regions have offered their services. The editors are listed below. We will be happy to receive and include in future Newsletters any information that any of these editors may care to send us. Colleagues may now send their research reports direct to us or to one of the editors listed below. Many thanks for your offers of help. It will be interesting to see how this new scheme works! At the very least we hope to see more information on research in progress included in the Newsletter.

Australia - Baker, Dix (Tasmania), Lucas (North Queensland), Rowe  
Austria - Fechter  
Brazil - Petersen, Tommasi  
Canada - Aldrich (Atlantic), Berger (Atlantic), Chia, Cousineau, Dearborn  
(Nova Scotia, Newfoundland)  
Chile - Larraín Prat  
Czechoslovakia - Prokop  
Europe - Jangoux  
France - Guille  
Germany - Fechter, Sato, Weber  
Guam/Micronesia - Eldredge  
Gulf and Caribbean area - Britton, Cutress (Puerto Rico), Kier, Lawrence  
Israel - Ferber, Fishelson, Sato  
Italy - Mortonese  
Indo-west-Pacific area - Devaney  
Japan - Oguro  
Korea - Sato  
Mexico - Bakus  
New Zealand - Baker, McKnight, Rowe  
Poland - Szymanska  
Scandinavian countries - Christensen  
Sweden - Bockalie, Franzen  
Switzerland - Hess (paleontology)  
taiwan - Sato  
United Kingdom - Binyon (London), A.M. Clark, Crump (Wales), Emson, Rose,  
Tyler (Wales), Wilkie (Scotland).  
U.S.A. - Bakus (Calif., Alaska), Carey (Pacific N.W., Alaska), Castro (S.  
Calif.), Dearborn (N. New England), Farmanfarmaian, Horowitz (Indiana  
paleontology), Kolata (midwest), Lawrence (S.E.), Macurda (midwest),  
Menge, Niesen (Calif. and Pacific N.W.), Pabian (Nebraska), Parsley (S.E.),  
Patent (Pacific N.W.), Phelan (Oregon), Scheutz, Serafy (mid Atlantic),  
Spencer (New England), Stancky (S.E.), Strimple (central), Wagner (Alaska),  
Webster (Pacific N.W.).  
Yugoslavia - Marovic, Zavodnik

Help!!!

We do not have accurate or up-to-date addresses for the people listed below. If you happen to have the correct address for any of them, please send it to us and we will restore the names to the Newsletter mailing list. Many thanks.

Acosta, Teresita	Edvardsen, Finn	Leviten, Paul
Bauer, John C.	Endelman, Losza	Malone, Mary
Birkner, Alan J.	Fernandez, Carol Mosher	Marcus, T.R.
Campbell, James	Grageda, Olga	McGinnis, M.
Clark, James F.	Harger, J.R.S.	McPherson, B.F.
Crippen, Robert	Jones, Ira	Mu, A.T.
Gurkin, E.K.	Lees, Dennis	Noble, P.B.

Albuquerque, Maria da Natividade

#### Miscellany

1. Placement Service: several people have suggested that those seeking employment in the field of echinoderm biology might advertise in the Newsletter, and that institutions and individuals who are seeking employees or graduate students might also advertise here. We are willing to include brief notices of this type on a trial basis.

2. Translations for sale or exchange: some of you who are as unskilled in foreign languages as we may have had important publications translated from one language to another for your own convenience. If you are willing to send copies of these to interested colleagues, please let us know what you have, what language the paper has been translated into, and what the cost will be.

Pawson has or will have soon the following publications:

Benning, A. 1949. Versuch einer Neuordnung der Familie Cucumariidae. Zool. J. Syst. 78:404-470. Translated into English. Cost of copying not yet determined.

Ilyaev, G. 1970. Revision of the holothurian genus Myriotrochus. Trudy Inst. Oceanol. 86:458-486. Translated into English. No charge.

EINAR BRUN, died July 13, 1976.

Dr. Einar Brun, known for his work on echinoderm populations, was killed in a light-plane crash on July 13, 1976.

Einar graduated from the University of Oslo, and then took his doctorate at the University of Liverpool. His thesis work dealt with the distribution and ecology of echinoderms of the Isle of Man. His work was in many ways a model for a project using SCUBA techniques to study the benthos, and his underwater photographs were superb.

He returned to Norway in 1969 to work at the Tromsø Museum and Marine Laboratory, of which he became Director in 1974. He attended the 1975 Echinoderms Conference in Rovinj, Yugoslavia, where he read a paper on the taxonomy of the genus Henricia.

In addition to his work with the echinoderms, Einar's research interests included biology of sea-birds, in which field he was the Norwegian authority, and possibilities of salmon farming in the ocean.

The Bruns lived on Kvaløya, the neighboring island to Tromsøya. Einar's small Piper Cub, on floats, was a major research tool, enabling him to reach his sea-bird colonies, and it was while flying from Tromsø to Bardu that he encountered the bad weather that caused the tragic accident.

Einar was an engaging person, and his ability and charm, his drive and energy, had ensured him a place as a leading biologist in his country. He initiated many exciting projects in the north of Norway, a region rich with biological problems awaiting such as he to galvanise research effort. He will be greatly missed.

- David Nichols.

JON WEBER, died June 1, 1976.

Jon N. Weber, well known for his work on the echinoderm skeleton, died on June 1, 1976.

Jon received his M.Sc. and Ph.D. in geochemistry at the University of Toronto. He then moved to Pennsylvania State University, where he became Professor of Marine Geology.

His recent tragic death represents a loss to echinoderm workers as well as to students of other groups. As an isotope geochemist, he had had virtually no biological or paleontological training, yet he was quick to learn what was necessary to work with biological materials and problems, and he was very effective in collaboration with specialists in fields unfamiliar to him. Through his isotope work, he made important contributions to problems of the physiology of the calcification process, not only in echinoderms, but also in corals and mollusks. His isotopic and chemical analyses were so numerous and carefully done that he was able to apply masses of data to subtle problems which had previously defied solution. He was a truly broad scientist who will be sorely missed by workers in several disciplines.

- David M. Raup



### Suggestions and Requests

BAKUS - would appreciate information on echinoderms that are toxic to fishes (biochemistry to behavior).

BERGER - would be pleased to provide interested people with a copy of a bibliography of the ciliate protozoans which inhabit echinoids. Any data on ciliates inhabiting urchins from S. Atlantic coasts of Africa and South America, Antarctica, Australia and New Zealand would be most welcome.

BROOKS - would like to have recent records or specimens of N.E. Pacific holothurians and any literature recently published.

DARTNALL - would like to hear from workers who have research interests in the area of Darwin, Australia. Also, he would be grateful to receive reprints of echinoderm papers to help build up his small institutional library.

EYLER - interested in observations on starfish migrations.

HAUGH - would like to have information or bulk samples of disarticulated material containing well-preserved crinoid arm ossicles from any horizon in the Paleozoic.

KELLER - seeks unpublished information on distribution of echinoids in sea grass environments.

LEWIS - seeks any information (other than that in Boolcotion, 1966) on distribution and feeding of echinoids, particularly Echinus.

MARCUS - wishes to have data on the distribution of Arbacia punctulata; interested in obtaining specimens (alive) from as many different localities as possible; seeks advice on possible collecting sites.

NIESEN - would welcome exchange of information and ideas on variation in growth rate and test morphology with habitat in irregular urchins.

SIBUET - seeks information on reproductive periodicities in abyssal echinoderms; also interested in age determination of individual ophiuroids (using some indicator such as growth bands ?).

SPRINKLE - would like to know the whereabouts of any well preserved echinoderms from the Bromide Formation (Middle Ordovician) of southern Oklahoma in museums or private collections for inclusion in a monographic study of this fauna.

WAHLMAN - would like to purchase Bassler, R.S. and M.W. Moody, 1943, Bibliographic and faunal index of Paleozoic pelmatozoan echinoderms. Geol. Soc. America Special Paper 45, 733 pp.

WARNER - would like to learn of any observations on suspension feeding in euryalous brittle-stars other than basket stars; also any records of stomach contents in these animals.

WELLS - urges more applied studies on effects of contaminants on various aspects of biology of echinoderms, especially on reproductive activity and larval stages.

YAMAGUCHI - seeks information on natural parthenogenesis in echinoderms.

AND:

IRIMURA - would like to receive ophiuroids of the families Ophiacanthidae, Amphiuridae and Ophiomyxidae for systematic study; exchange of specimens welcomed.

KRISHNAN - would like to have references or papers covering aspects of reproductive biology (including ultrastructural studies of gonads) in tropical as well as temperate holothurians, in order to update an article on reproductive biology of holothurians.

LAWRENCE - will send to interested people for \$1.50 (copying and postage) the complete list of approximately 250 titles of theses and dissertations dealing with echinoderms.

### Current Research Projects

- ARNAUD - Pelecypods associated with antarctic cidaroid echinoids; ecology and adaptations in antarctic and subantarctic marine benthic organisms.
- ATWOOD - Fine structure of echinoderm spermatozoa and eggs; fertilization in holothurians.
- AUSICH - Functional morphology of Pisocrinus and Parapisocrinus.
- BERGER - Biology of echinoid-inhabiting ciliate Protozoa; systematics, morphometric variation; intrainstestinal distribution, zoogeography.
- BELL - Systematics and functional morphology of cyathocystid and pyrgocystid edrioasteroids; nature of attachment and of attachment sites of edrioasteroids; taxonomic and morphologic studies of assorted edrioasteroids.
- BERNASCONI - Ophiuroids of the coast of Argentina (with D'Agostino).
- BROOKS - Holothurians of the north-east Pacific; distribution, ecology, taxonomy.
- BUNDRICK - Reproductive biology of Californian ophiuroids, particularly Ophiothrix spiculata, Amphiodia occidentalis, and Amphipholis spp.
- CHAUVEL - Diploporitid cystoids (Maroc, Massif armoricain, Espagne); carpoids (Massif armoricain).
- CLARK, A.M. - Echinoderms of Amsterdam and St. Paul Island; taxonomy of some Poraniidae (Asteroidea) with reduced skeletons; deep-water Atlantic crinoids.
- DARTNALL - Australian and Indo-Pacific Asterinidae. Echinoderm fauna of vicinity of Darwin, Australia.
- DAYTON - Nearshore ecology.
- DEARBORN - Food and feeding ecology of asteroids and ophiuroids from the Arctic, Antarctic and Gulf of Maine; taxonomy and ecology of Antarctic crinoids.
- DIX - Background study on commercial utilization of Heliocidaris erythrogramma in Tasmania, Australia; breeding cycles, gonad yields.
- DOWNNEY - Asteroids of the Atlantic Ocean (with A.M. Clark); reproduction of deep-sea asteroids.



- ELLINGTON - Carbohydrate metabolism in holothurians; enzyme polymorphisms in echinoderms.
- ENGSTROM - Effects of predation by Cassia tuberosa on regular sea urchins in sea grass beds.
- EYLLERS - Molecular basis of the mechanical properties of holothurian body wall.
- FECHTER - Echinoderms collected by the R/V Meteor.
- GALE - Cretaceous Asteroidea and Crinoidea from western Europe; taxonomy, morphology, evolution and paleoecology.
- GIESE - Physiology of echinoderm (asteroid, echinoid) body wall.
- GUILLE - Ophiuroid fauna of Madagascar (with Cherbonnier); echinoderms of Kerguelen Island; benthic ecology of continental plateau of Kerguelen.
- HAUDE - Morphology of jaw apparatus of eleutherozoan echinoderms; crinoid stems; Devonian echinoderms; Paleocology of Upper Silurian Scyphocrinites layers.
- HAUGH - Nervous and muscle systems of Paleozoic crinoids; "paleophysiology" and a theory of dynamic balance and sensory organs in Mississippian camerate crinoids; coelomic organization of the Camerata as evidence of echinoderm ancestry and evolution.
- HENDERSON - Cenozoic Australasian clypeasteroid echinoids of the Family Arachnoididae; Late Cambrian eocrinoids from western Queensland, Australia.
- HILL - Cloacal rhythmicity and local degeneration in holothurians.
- HYLANDER - Comparative aspects of fertilization and mechanisms of species-specificity; ultrastructure of echinoderm gametes and events of fertilization.
- JAMES - Shallow-water echinoderms of the Andaman Islands.
- JANGOUX - Structure and function of digestive systems of seastars and sea urchins; echinoderms of Africa south of Sahara.
- KANATANI - Mechanisms of oocyte maturation in starfish.
- KELLER - Population dynamics of Jamaican Tripneustes ventricosus and Lytechinus variegatus; the role of these species and fishes as structuring forces of the infauna and seagrass communities.

- KOBAYASHI - Marine pollution bioassay by sea urchin eggs.
- KOGO - Crinoid fauna of Japanese and neighboring waters.
- KOLATA - Solutan carpod family Iowacystidae; crinoids from Middle Ordovician Bromide Formation of Oklahoma (with Sprinkle and others); Middle Ordovician echinoderms from upper Mississippi River valley (with Strimple and others).
- KOMATSU - Development and metamorphosis of sea stars.
- KYTE - Northeastern Pacific Ophiuroidea; systematics and deep-sea ecology. Gorgonocephalus, systematics and some aspects of biology; Panama ophiuroids, systematics.
- LEWIS - Ecology of subtidal populations of Echinus.
- LIDDELL - Niche structuring of shallow water Caribbean crinoids; biostratigraphy of Recent and fossil echinoderms, particularly crinoids; paleoecology of Ordovician and Silurian echinoderms.
- MACKIE - Distribution of steroidal saponins in the Echinodermata and their ecological significance; mode of action of saponins on cell membranes.
- MALUF - Echinoderm diversity, Gulf of California.
- MARCUS, N.H. - Population genetics of Arbacia punctulata; effect of temperature upon isozyme production in the larval phase of A. punctulata.
- MARSH - Systematics of Western Australian asteroids; revision of the genus Hacelia (with Rowe).
- MEYER - Ecology and functional morphology of Indo-Pacific crinoids (with Macurda); association of a polychaete with the ophiuroid Ophiocoma echinata (with Hendler); biological and physical fluctuations in the reef flat communities of Atlantic Panama.
- MLADENOV - Reproductive biology of Ophiothrix oerstedti, Ophiothrix suensoni, Ophiocoma echinata.
- MUKAI - Ecology, population dynamics and feeding preferences in sea-stars.
- MUSCAT - Growth and reproduction of Ophioplocus esmarki.
- NAVEN - Ecology of Asterias rubens in parts of Kiel Bay.
- NESTLER - Regular echinoids of the Upper Cretaceous.

- NIESEN - Variation in growth rate and test morphology in Dendraster excentricus populations.
- OHTA - Ecological investigations of deep-sea megalo-benthos; quantitative estimation and analysis of spatial patterns using deep-sea stereocamera.
- OLDFIELD - Surface fine structure of echinoids; taxonomic applications.
- OLVER - Taxonomy and paleoecology of British Jurassic irregular echinoids.
- PARSLEY - North American Mitrata (with Caster); primitive echinoderms of the Bromide Formation of Oklahoma; echinoderms of the Lexington Limestone of Kentucky.
- PAUL - Simulation of respiratory exchange in fossil echinoderms; British Ordovician cystoids; Scandinavian Ordovician echinoderms; North American Silurian Rhombifera.
- PAWSON - Antarctic and Indo-west-Pacific holothurians, systematics.
- PEARSE - Kelp forest ecology; echinoid reproduction.
- PHELAN - Processes by which accessory tube feet and lateral water vessels are added to clypeasteroid plates with growth.
- PROKOP - Bohemian Devonian echinoderms, mainly crinoids from the boundary lower-middle Devonian; systematics, biostratigraphy, paleoecology.
- ROSE - Mediterranean Tertiary echinoids; paleoecology of Jurassic irregular echinoids.
- ROUX - Post-Paleozoic stalked crinoids: microstructure and ontogeny of the stem; stalked crinoids of the Bay of Biscay.
- RUTMAN - Reproductive activity of feather-stars Lamprometra klunzingeri (Hartlaub) and Hathrometra savignyi (Müller) from the Gulf of Eilat (Red Sea).
- SANCHEZ - Comparison of the organization of surface currents due to ciliary action in asteroids.
- SCHEIBLING - Ecology of geographically separated populations of Oreaster reticulatus in the Grenadines: population structure, distribution, feeding and reproductive cycle.
- SHAFFER - Ophiuroids; salinity tolerance of Ophiothrix angulata.
- SHIRAI - Mechanisms of oocyte maturation in starfish.

- SIBUET - Ecology of abyssal echinoderms in the Bay of Biscay, including reproductive periodicities of some ophiuroids; the asteroid genus Hymenaster in the Atlantic Ocean.
- SINGLETARY - Biology and ecology of Leptosynapta inhaerens.
- SLOAN - Predatory behavior of the British sunstar Crossaster papposus.
- SPEEL - Antarctic crinoids; statistical analysis of morphological variation in crinoids; coastal survey of marine invertebrates from Goldsboro Bay to Calais, Maine.
- STANCYK - Larval nutrition; population dynamics of estuarine ophiuroids.
- STRATHMANN - Limitations of ciliary feeding mechanisms in larvae and consequences for larval morphology; limitations on distribution of ambulacra; adaptive aspects of complex life cycles.
- STRIMPLE - Pennsylvanian and Mississippian crinoids; Permian crinoids from southwest Texas; upper Cambrian echinoderms of SE Missouri (with Sprinkle); solutan carpoids (with Kolata and Levorson); Moscovocrinus from Belitung Island, Indonesia (with Yancey); Ordovician echinoderms from Iowa and Illinois.
- SUMMERS - Investigations of mechanisms controlling species-specificity of fertilization.
- TAKASHIMA - Cytochemistry in oogenesis, including radioautography and X-ray microanalysis.
- THOMAS - Atlantic ophiuroids; Ophiopsila, Ophiura, Astroschema, Ophiomusium, Ophiacantha and related genera.
- THOMPSON, G.B. - Distribution and abundance of echinoderms, especially sea urchins, in Hong Kong coastal waters, with particular reference to influences of pollution.
- TOWN - Biology and ecology of the New Zealand sea-star Astrostole scabra, with particular reference to breeding cycle, physiological tolerances, population dynamics.
- TURNER - Organic composition of echinoderm eggs; changes in organic composition of echinoderm embryos and larvae during development; ultrastructure and function of epidermal glands of juvenile Synaptula hydriformis during intracoelomic incubation; intra-ossicle resorption of calcite.
- UBAGHS - The genus Abacocrinus (Crinoidea, Camerata) from the Silurian of Gotland; systematic description of some new Stylophora.

- VOOGT - Reproductive physiology of Asterias rubens; storage and release of lipids; sterol and steroid metabolism. (Together with Oudejans, Broertjes and Schoenmakers).
- WAHLMAN - Cystoids and crinoids from Middle Silurian reefs in Indiana and Ohio; stratigraphic occurrence and paleoecology of the Upper Ordovician cystoid Lepadocystis moorei (Meek).
- WARNER - Suspension feeding in echinoderms; dense populations of echinoderms.
- WEBER - Chemical composition, isotopic composition, mechanical properties and microstructural characteristics of skeletal calcites deposited by echinoderms; replication of echinoderm skeletal pore microstructures into ceramic, polymer, metal, and composite biomaterials for prosthetic implant applications in humans.
- WELCH - Carboniferous crinoids; functional morphology of crinoids.
- WELLS - Use of Strongylocentrotus droebachiensis as a test organism in acute toxicity bioassays with industrial effluents discharged into coastal areas.
- YAMAGUCHI - Larval development and geographical distribution of coral reef asteroids; life history of the parthenogenetic asteroid Ophidiaster granifer Lütken; population structure, spawning and growth of the coral reef asteroid Linckia laevigata; reproductive strategies of coral reef asteroids.
- YENSEN - Ecology of sunstar Heliaster kubinji, Sonora, Mexico.

## Theses and Dissertations

Addendum to the lists of Ph.D. Dissertations and Masters' Theses concerning echinoderms. Previous lists published in the Newsletter: No. 3 (April 1971); No. 4 (December 1972); No. 6 (April 1975). Prepared by John M. Lawrence.

### Ph.D. Dissertations:

- Annala, J.H. 1974. Foraging strategies and population effects of Asterias rubens and Nucella lapillus. Univ. of New Hampshire.
- Anderson, C.L.R. 1974. Determination of tubulin pool size and patterns of synthesis during early sea urchin development. Purdue.
- Asterita, H.L. 1962. Pressure-temperature studies on the hyaline membrane of sea urchin eggs. New York U.
- Badman, W.S. 1968. Serological studies of embryogenesis in echinoids. U. of Florida.
- Berry, C.T. 1934. Miocene and Recent Ophiura skeletons. Johns Hopkins.
- Boylan, E.S. 1972. Aspects of gene activity during oogenesis in the amphibian Xenopus laevis and the starfish, Asterias forbesi. Cornell.
- Brandriff, B.F. 1975. Parthenogenesis in the sea urchin Lytechinus pictus. U. of California, Santa Cruz.
- Brehm, P.H. 1975. Bioluminescence: the anatomy and physiology of its nervous control in Ophiopsila californica (Echinodermata: Ophiuroidea). U. of California, Los Angeles.
- Brett, C.E. 1963. Relationships between marine invertebrate infauna distribution and sediment type in Bogue Sound, North Carolina. U. of North Carolina. (Includes Ophiura and Moiria).
- Brower, J.C. 1965. Evolution and Classification of primitive actinocrinitids. U. of Wisconsin.
- Cameron, R.A. 1975. The initiation and early events of metamorphosis of sea urchins. U. of California, Santa Cruz.
- Candelas, G.C. 1966. A study of sea urchin polyribosomes in their relation to the control of protein synthesis. U. of Miami.
- Case, S.E. 1974. Dynamic properties of chromosomal D.N.A. isolated from sea urchin embryos. U. Southern California.
- Chase, D.G. 1967. Inhibition of the cortical reaction with high hydrostatic pressure and its effects on the fertilization and early development of sea urchins. U. of Washington.
- Cochran, R.C. 1974. Spawning induced by radial nerve and gonad factors during the temperature-regulated reproductive cycle of the purple sea urchin, Strongylocentrotus purpuratus (Stimpson). U. of California, Los Angeles.



- Cohen, H. 1968. Sea urchin polysomes and their function during embryogenesis. U. of Miami.
- Colon, D. 1974. Comparison of the biological activities of crude and purified holothurin from the tubules of the Bahamian sea cucumber Actinopyga agassizi Selenka. New York: U.
- Davidson, J.M. 1974. On the role of the epithelial basal lamina in echinoid morphogenesis. Stanford.
- Dubroff, L.M. 1975. Molecular classes of heterogeneous nuclear R.N.A. in sea urchin embryos. U. of Pennsylvania.
- Eckberg, W.R. 1975. Altered pattern of gene activity in abnormal sea urchin morphogenesis. Michigan State U.
- Elder, C. 1912. The relation of the zona pellucida to the formation of the fertilization membrane in the egg of the sea urchin (Strongylocentrotus purpuratus). U. of California, Berkeley.
- Engstrom, N.A. 1974. Population dynamics and prey-predator relations of a dendrochordate holothurian, Cucumaria lubrica, and sea stars in the genus Solaster. U. of Washington.
- Estes, A. 1974. Population numbers, feeding behavior and the ecological importance of sea otters in the western Aleutian islands, Alaska. U. of Arizona (Includes effect of predation on Atronyx)
- Wylers, P. 1975. Functional morphology of the skeleto-muscular system of the starfish, Asterias forbesi. Duke.
- Fowler, L. 1972. Distribution of magnesium and strontium in the skeletons of modern regular echinoids from the United States Atlantic coast and the Caribbean Sea. Indiana U.
- Fry, H. 1925. Asters in artificial parthenogenesis. I. The origin of the amphiasar in eggs of Echinarachnius parma. Columbia.
- George, F. 1967. Polysome differences during the first division cycle of the sea urchin egg. U. of Miami.
- Goldstein, S.F. 1968. Local activation and inactivation experiments on flagella. California Inst. of Technology. ("sea urchins")
- Hand, G. 1967. Correlations between germ layer differentiation and sequential synthesis of ribonucleic acid during embryogenesis of the starfish Asteria forbesi. U. of North Carolina.
- Hanson, C. 1968. The effects of versene on dividing sea urchin eggs. Oregon State U.
- Hart, R. 1967. The effect of spermatozoan senescence on embryonic mortality in Rana pipiens and Arbacia punctulata. U. of Illinois.

Hartmann, J.F. 1968. The isolated mitotic apparatus: studies on nucleoproteins. U. of Toronto.

Hibbard, H. 1921. Cytoplasmic inclusions in the egg of Echinarachnius parma. Bryn Mawr.

Hudson, J.L. 1974. Translational modulation of protein synthesis by sea urchin transfer R.N.A. U. of Miami.

Karlson, R.H. 1975. The effects of predation by the sea urchin, Arbacia punctulata, on a marine epibenthic community. Duke.

Kastendiek, J.E. 1975. The role of behavior and interspecific interactions in determining the distribution and abundance of Renilla kollikeri Pfeffer, a member of a subtidal sand bottom community. U. of California, Los Angeles. (includes roles of Bendraster and Astropecten).

Kew, W.S.W. 1917. Cretaceous and Cenozoic Echinoidea of the Pacific Coast of North America. U. of California, Berkeley.

Krischer, K.N. 1967. Studies in proteolytic enzymes in the sea urchin egg. U. of Miami.

Low, C.J. 1975. The effect of grouping on Strongylocentrotus franciscanus, the giant red sea urchin, on its population biology. U. of British Columbia.

Macurda, D.B. 1963. Studies on the blastoid genus Orophocrinus. U. of Wisconsin.

Mayo, P. 1974. Ecological, chemical and behavioural studies of avoidance responses in sea-stars. U. of Aberdeen.

Mastrangelo, M.F. 1965. A study of the vegetalizing action of tyrosine on the sea urchin embryo. Yale.

Meeker, G.L. 1968. Some effects of intracellular potassium deficiency on cleavage in echinoid eggs. Washington State U.

Myers, A.C. 1973. Sediment reworking, tube building, and burrowing in a shallow subtidal marine bottom community: rates and effect. U. Rhode Island.

Mundell, R.D. 1965. Immunological studies on the starfish oocyte nucleus. U. of Pittsburgh.

Nicotri, M.E. 1974. Resource partitioning, grazing activities and influence of the microflora by intertidal limpets. U. of Washington (includes Leptasterias, Pisaster).

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#### More Current Research Projects

BLANKENSHIP - deep-sea holothurians off California.

BRETT - revision of classification of Stephanocrinus (with Breimer); Ordovician hardground echinoderm communities of Kirkfield, Ontario area; echinoderm paleoecology of Middle Silurian Waldron Shale of Indiana and Tennessee.

CARCAMO - chilean asteroids.

IRIMURA - ophiuroids of Prince Harald Coast, Antarctica; ophiuroids of Sagami Bay.

CHAFFEE - ecology and morphology of asteroids.

KRISHNAN - reproductive and nutritional cycles in the echinoid Salmacis virgulata.

SHIRLEY - systematics and ecology of Gulf of Mexico echinoderms.

TORTONESE - echinoderms of the northern Red Sea; echinoderms of Somaliland.

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# Recent Publications and Papers in Press

This list is based upon Newsletter replies plus reprints received. Please note that many of the papers listed below as "in press" will already have been published.

- ARNAUD, P.M., 1974. Contribution a la bionomie marine benthique des regions antarctiques et subantarctiques. *Tethys*, 6 (3): 465-656.
- ATWOOD, D.G., 1974. Fine structure of spermatogonia, spermatocytes and spermatids of the sea cucumbers Cucumaria lubrica and Leptosynapta clarki (Echinodermata: Holothuroidea). *Can. J. Zool.*, 52: 1389-1396.
- \_\_\_\_\_, 1974. Fine structure of an elongated dorsoventrally compressed echinoderm (Holothuroidea) spermatozoon. *J. Morph.* 145: 189-203.
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- \_\_\_\_\_ and F.S. Chia, 1974. Fine structure of an unusual spermatozoon of a brooding sea cucumber, Cucumaria lubrica. *Canadian Jour. of Zool.* 52 (4): 519-523.
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- \_\_\_\_\_, H.L. STRIMPLE and C.O. LEVORSON, in press. Edrioasteroids (Echinozoa) of the Maquoketa Formation of Iowa. Iowa Acad. Sci. 12.
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